

Name: \_\_\_\_\_ Date: \_\_\_\_\_

### Polynomial Factoring solution (version 668)

1. The quadratic formula says if  $ax^2 + bx + c = 0$  then  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ . Use the quadratic formula to solve the following equation.

$$x^2 - 10x + 37 = 0$$

Simplify your answer(s) as much as possible.

#### Solution

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(37)}}{2(1)}$$

$$x = \frac{-(-10) \pm \sqrt{100 - 148}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{-48}}{2}$$

$$x = \frac{10 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{10 \pm 4\sqrt{3}i}{2}$$

$$x = 5 \pm 2\sqrt{3}i$$

Notice that  $i$  is NOT under the square-root radical symbol!!

2. Express the product of  $2 - 8i$  and  $7 + 6i$  in standard form  $(a + bi)$ .

#### Solution

$$(2 - 8i) \cdot (7 + 6i)$$

$$14 + 12i - 56i - 48i^2$$

$$14 + 12i - 56i + 48$$

$$14 + 48 + 12i - 56i$$

$$62 - 44i$$

### Polynomial Factoring solution (version 668)

3. Write function  $f(x) = x^3 - 3x^2 - 13x + 15$  in factored form. I'll give you a hint: one factor is  $(x + 3)$ .

**Solution**

$$\begin{array}{c|cccc} & 1 & -3 & -13 & 15 \\ -3 & & -3 & 18 & -15 \\ \hline & 1 & -6 & 5 & 0 \end{array}$$

$$f(x) = (x + 3)(x^2 - 6x + 5)$$

$$f(x) = (x + 3)(x - 5)(x - 1)$$

4. Polynomial  $p$  is defined below in factored form.

$$p(x) = (x + 3)^2 \cdot (x - 2) \cdot (x - 5)^2$$

Sketch a graph of polynomial  $y = p(x)$ .

